

REMARKS

Reconsideration of this application is respectfully requested in view of the following remarks.

As a preliminary matter, the Applicants appreciate the indication of allowable subject matter in claims 16 and 17 of the present application.

Claims 1-12 and 14-24 are currently pending in the application and subject to examination.

Entry of this Response is proper under 37 C.F.R. § 1.116 since this Response: (a) places the application in condition for allowance for reasons discussed herein; (b) does not raise any new issue regarding further search and/or consideration since the Amendment amplifies issues previously discussed throughout prosecution; (c) does not present any additional claims without canceling a corresponding number of finally-rejected claims; and (d) places the application in better form for appeal, should an appeal be necessary. The response is necessary because it is made in reply to arguments raised in the rejection. Consideration of this Response is thus respectfully requested.

In the Office Action mailed August 10, 2006, the claims 1-12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,369,622 to Lim et al. (hereinafter "Lim") in view of U.S. Patent No. 6,529,051 to Tokumitsu et al. (hereinafter "Tokumitsu"). Claim 14 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Lim in view of Tokumitsu and U.S. Patent No. 6,545,481 to Emberty et al. (hereinafter "Emberty"). Claims 15 and 18-22 were rejected under 35 U.S.C. § 103(a)

as being unpatentable over Lim in view of U.S. Patent No. 6,100,731 to Otaka and further in view of Emberty. Claim 23 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Lim in view of Tokumitsu and U.S. Patent No. 6,529,051 to Takahashi. Claim 24 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Lim in view of Tokumitsu and U.S. Patent No. 4,658,323 to Dougherty. The Applicant respectfully TRAVERSES the Examiner's obviousness rejections, as follows.

Claim 1 Recites Patentable Subject Matter

In order for the Examiner to establish a *prima facie* case for obviousness, three (3) criteria must be met. First, there must be **some suggestion or motivation, either in the references themselves or in the knowledge generally available to those of ordinary skill in the art, to modify the primary reference as the Examiner proposes**. Second, there must be a reasonable expectation of success in connection with the Examiner's proposed combination of the references. And third, the prior art references must **disclose or suggest all of the claim limitations**. MPEP 2143 (emphasis added). Furthermore, a proper proposed suggestion or motivation to combine references **cannot render the prior art invention being modified unsatisfactory for its intended purpose**. MPEP 2413.01; *see also In re Gordon*, 733 F.2d 900 (Fed. Cir. 1984) (Emphasis added).

The Applicant submits that the Examiner fails to establish a *prima facie* case for obviousness because the Examiner has failed to satisfy his burden of showing that the prior art discloses or suggests all of the claimed limitations of claims 1-12 and 14-22,

and further has failed to show proper suggestion or motivation for the obviousness rejection.

Regarding claim 1, the Applicant respectfully submits that the cited prior art, taken alone or in combination, fails to disclose or suggest at least the combination features of the present invention of "a waveform combining section for generating a combined waveform by **combining signal waveforms of the same polarity obtained by wave-rectifying the fundamental signal and the phase shift signal . . . and a comparator section for comparing the combined waveform with a comparison threshold value,**" as recited in claim 1 (Emphasis added).

The Office Action admits that Lim "fails to disclose combining signal waveforms of the same polarity obtained by wave-rectifying the fundamental signal and a phase shift signal." See office Action, at page 3. However, the Office Action contends that Tokumitsu corrects this deficiency in Lim.

The Applicant respectfully disagrees with this contention, and submits that the rectifying circuit of Tokumitsu is arranged to cancel out a fundamental and odd harmonics to enhance even harmonics, so that a sine waveform is multiplied by the enhanced even harmonics. The Tokomitsu rectifying circuit is used to selectively pick up a higher harmonic signal previously determined with respect to the fundamental signal.

By contrast, the present invention is arranged to rectify the claimed **"fundamental signal and a (at least one) phase shift signal to generate a combined signal waveform of the same polarity,"** thereby producing a multiplied

original signal (Emphasis added). This original signal is compared with a comparative threshold to generate a multiplied logical signal. Furthermore, in the present invention, at least one phase shift signal as well as the fundamental signal is rectified to produce a multiplied waveform. It is thus possible to freely select the number of multiplications and the waveform shapes according to the phase of the phase shift signal and the number of signals.

The Applicant respectfully submits that the rectifying circuit of Tokumitsu is configured to select the higher harmonic signal as a multiplying signal, and is different in operation and effect from the present invention, in which a plurality of signals having different phases from each other are rectified to allow free choice of the number of multiplications and the waveform shapes. Therefore, the rectifying circuit of Tokumitsu neither discloses nor suggests at least the **"fundamental signal and a (at least one) phase shift signal to generate a combined signal waveform of the same polarity,"** as claimed in claim 1 of the present invention. This feature of the present invention is therefore completely missing from the cited art.

With respect to another aspect of the rejection of claim 1, the Office Action asserts that Lim discloses a frequency multiplier with the claimed "phase shift section for generating at least one phase shift signal for a fundamental signal." The Office Action admits that Lim fails to disclose or suggest the claimed **"comparator section for comparing the combined waveform with a comparison threshold value,"** as recited in claim 1, but contends that Lim shows a comparator section before the waveform combining section and that "it would have been obvious . . . to modify the frequency

multiplier of Lim to arrange a comparator section after the waveform combining section, as taught by Lim, in order to have various arrangement of the parts without affecting the result of the multiplier." See Office Action, at page 3.

The Applicant respectfully disagrees with this contention in the Office Action, and submits that the proposed motivation is improper. Specifically, the waveform combining section disclosed in Lim is a XOR gate. The input signal for the XOR must be a logic signal, as the XOR gate is capable of accepting only logic signals as inputs. In Lim, the signals at nodes B and C are rounded signals, not logic signals. See Lim, column 3, lines 48-49. It is therefore impossible, as the Office Action contends, to realize a circuit configuration in Lim such that that the XOR gate is be arranged before voltage comparators 131 and 132, thereby receiving as an input the rounded signals at nodes B and C. The proposed motivation would render Lim inoperable, and is therefore improper.

For at least these reasons, the Applicant submits that claim 1 is allowable over the cited prior art. As claim 1 is allowable over the cited prior art, the Applicants submit that claims 2-12 and 14-24, which depend from allowable claim 1, are allowable over the cited prior art for at least the same reasons as allowable claim 1.


Conclusion

For all of the above reasons, it is respectfully submitted that the claims now pending patentability distinguish the present invention from the cited references. Accordingly, reconsideration and withdrawal of the outstanding rejections and an issuance of a Notice of Allowance are earnestly solicited.

Should the Examiner determine that any further action is necessary to place this application into better form, the Examiner is encouraged to telephone the undersigned representative at the number listed below.

In the event this paper is not considered to be timely filed, the Applicants hereby petition for an appropriate extension of time. The Commissioner is hereby authorized to charge any fee deficiency or credit any overpayment associated with this communication to Deposit Account No. 01-2300, referring to client-matter number 024016-00026.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Juliana Haydoutova', is written over a horizontal line.

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